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Peculiarities of femtosecond photon echo signals in dye-doped polymer films at high temperatures

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Abstract

Some results of femtosecond echo experiments on polyvinylbutyral polymer films doped with phtalocyanine molecules at high (up to room) temperatures are reported. Special attention is paid to the stimulated femtosecond photon echo (SFPE), which was observed in a solid-state medium at room temperature for the first time. A decay curve of the SFPE signal has been obtained and theoretically analyzed. The results of the analysis indicate that the random interaction between impurity molecules and quasi-localized low-frequency vibration modes in an amorphous matrix plays the dominant role in the character of optical dephasing at high temperatures.

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